

CENTER FOR HEALTH INFORMATION AND ANALYSIS

METHODOLOGY PAPER

**RELATIVE
PRICE**

SEPTEMBER 2016



INTRODUCTION

Relative price (RP) is a calculated, aggregate measure used to evaluate variation in health care provider prices. The Center for Health Information and Analysis (CHIA) is statutorily mandated to collect and report data on relative prices from private and public health care payers operating in the Massachusetts health care market.¹ RP reporting supports the Commonwealth's goals of promoting transparency, cost containment, and efficiency.

RP compares prices paid to different providers within a payer's network, while accounting for differences in the quantity and types of services delivered by providers and for differences in the types of insurance products offered by payers.

DATA COLLECTION

Timeline

RP data files are collected annually on June 1. Payers submit three files corresponding to different provider types—Hospitals, Physician Groups, and Other Providers.² Hospital and Other Provider data correspond to the previous calendar year. Physician Group data correspond to the calendar year ending 17 months prior to the deadline, which allows sufficient run-out for claims to be processed and for contractual non-claims based payment settlements to be finalized.

Data Submitters

CHIA collects RP data from payers operating in the Massachusetts commercial health insurance market, commercial payers offering Medicare Advantage plans, and MassHealth Managed Care Organizations (MCOs).^{3,4} Payers report data for all Massachusetts-based providers with whom they contract, including payments on behalf of non-Massachusetts residents who receive care from Massachusetts providers.

-
- 1 CHIA is required by Massachusetts General Law (M.G.L.) chapter 12C to promulgate regulations for the uniform calculation and reporting by payers of provider relative prices, and to publicly report that data. The Code of Massachusetts Regulations (CMR) 957 2.00 governs the methodology and filing requirements for health care payers to calculate and report these data to CHIA.
 - 2 Other provider types include ambulatory surgery centers, community health centers, community mental health centers, freestanding clinical laboratories, freestanding diagnostic imaging centers, home health agencies, and skilled nursing facilities.
 - 3 Historically, CHIA also has collected data from payers offering Commonwealth Care products, a state insurance program providing coverage to low- and moderate-income residents ineligible for MassHealth coverage. The Commonwealth Care program ended in January 2015, and will no longer be reported for data years 2016 onward.
 - 4 A full list of payers required to submit RP data to CHIA can be found here: <http://www.chiamass.gov/list-of-payers-required-to-report-data>.

DATA AND METHODOLOGY

Payers submit three data files for different provider types: Hospitals, Physician Groups, and Other Providers. RP is calculated by payer for each of the payer's networks. A network is defined as a provider type-insurance type combination, e.g., Acute Hospital-Commercial or Physician Group-Medicare Advantage. Within each network, RPs are calculated separately for each product type, as well as for all products combined.

Payers report data for the following insurance categories:

- Medicare Advantage
- Medicaid Managed Care Organization (MCO)
- Commonwealth Care⁵
- Commercial (self and fully insured)
- Medicare and Medicaid Dual-eligibles, aged 65 and over
- Medicare and Medicaid Dual-eligibles, aged 21-64⁶
- Other

Payers report the following product types:

- Health Maintenance Organization and Point of Service (HMO and POS)
- Preferred Provider Organization (PPO)
- Indemnity
- Other

The basic steps for computing RP are the same across all file types:

1. Compute provider-specific aggregate price levels.
2. Take average of provider-specific price levels to obtain the network average price level.
3. For each provider, divide provider-specific price level by network average price level to obtain each provider's RP.

By construction, the network average RP equals 1.0 for each payer network. Providers with RP above 1.0 receive higher-than-average payments in a payer's network, and vice versa. RP is an aggregate measure for assessing providers' overall price levels across all services. It is not designed to compare provider prices for particular services. And, because the measure is specific to each payer's network, RP values are not directly comparable across payers.⁷

⁵ See note 3.

⁶ Dual-eligibles aged 21-64 are covered under Massachusetts One Care program.

⁷ For example, the network average price level for payer A corresponds to \$200, while the network average price level for payer B is \$100. Provider X has RP=0.8 for payer A, which represents an absolute dollar amount of $0.8 * \$200 = \160 . The same provider has RP=1.5 for Payer B, which corresponds to an absolute dollar amount of $1.5 * \$100 = \150 . The example illustrates that a higher relative price value may not translate to higher absolute price; therefore RP cannot be used draw conclusions about absolute price levels across payers.

Each of the RP file types and corresponding RP calculations are described in more detail below.

HOSPITAL RP

Within the Hospital file, payers report data for four hospital types—Acute, Chronic (or long-term care), Rehabilitation, and Psychiatric.⁸ Within these provider types, payers report inpatient and outpatient services separately.

HOSPITAL INPATIENT

For each hospital, payers submit number of discharges, total claims payments, total non-claims payments (such as bonuses for financial performance or for meeting certain quality targets), and case mix index (CMI), which captures the relative health of the population treated.⁹ Payers also submit product mix values, defined as the percentage of total payments attributed to each product type (see Table A).

Table A. Sample Product Mix Calculation for Inpatient Hospital

	Product Type				
	HMO and POS	PPO	Indemnity	Other	Total
Total Payments (claims + non-claims)	\$52,000	\$20,000	\$17,000	\$11,000	\$100,000
Product Mix	0.52	0.20	0.17	0.11	--

Table B contains a simple illustration of the inpatient data elements submitted by payers. The payer in this example reported four hospitals and two product types (HMO, PPO) in its Acute Hospital-Commercial network.

⁸ RP Hospital designations follow those used by the Centers for Medicare and Medicaid Services (CMS) to delineate hospitals subject to or exempt from Medicare’s inpatient prospective payment system, as defined in the Code of Federal Records (42 CFR 412.23).

⁹ Hospital inpatient discharges are assigned to diagnosis-related groups (DRGs), based upon diagnosis and other factors. Each DRG is assigned a weight that reflects the relative amount of resources required to treat patients in the group, which determines provider reimbursement. A hospital’s CMI equals the average DRG weight for their patients. Higher CMI represents a more clinically complex population.

Table B. Sample Hospital Inpatient Data

Hospital	Hospital Type	Insurance Category	Product Type	Discharges	Total Claims Payments	Total Non-Claims Payments	Case Mix Index	Product Mix
Hospital 1	Acute	Commercial	HMO	251	\$460,661	\$105,491	1.5	0.46
	Acute	Commercial	PPO	237	\$582,240	\$81,406	1.6	0.54
Hospital 2	Acute	Commercial	HMO	73	\$453,685	\$90,602	0.7	0.76
	Acute	Commercial	PPO	295	\$56,882	\$111,764	1.8	0.24
Hospital 3	Acute	Commercial	HMO	49	\$955,453	\$76,962	0.7	0.85
	Acute	Commercial	PPO	228	\$61,774	\$125,589	0.7	0.15
Hospital 4	Acute	Commercial	HMO	242	\$838,973	\$128,995	1.8	0.48
	Acute	Commercial	PPO	78	\$965,899	\$89,544	0.6	0.52

Computing Hospital Inpatient Relative Price (Product-Specific):

Step 1. Compute provider-specific, product-specific price levels. For inpatient data, this equals the cost per case mix-adjusted discharge, referred to as the Adjusted Base Rate (ABR). For a particular product type, e.g., HMO, this is defined as follows:

$$Adjusted\ Base\ Rate\ (ABR)_{HMO} = \frac{(Total\ claims + Total\ NonClaims)_{HMO}}{(Discharges_{HMO}) * (CMI_{HMO})}$$

Discharges are weighted by case mix index to control for variation in patient acuity across providers. A CMI of 1.0 represents average population health. CMI greater than 1.0 indicates a more complex patient population (i.e., a patient population that requires more intensive resource use than average), while CMI less than 1.0 indicates a less complex set of patients. (See Table C, Column C5.)

Step 2. Calculate the product-specific network average price level. For inpatient RP, this equals the arithmetic mean of all hospitals' ABR for HMO. (See Table C, Column C7.)

Step 3. Calculate product-specific RP ratios for each provider. To do this, divide each hospital's product-specific ABR by the corresponding network average ABR for that product. (See Table C, Column C6.)

$$RP_{HMO} (Hosp 1) = \frac{ABR_{HMO} (Hosp 1)}{(Network\ average\ ABR_{HMO})} = \frac{\$1,503.72}{\$11,119.21} = 0.14$$

Table C. Computing Product-Specific Hospital Inpatient RP

				C1	C2	C3	C4	C5	C6	C7
Hospital	Hospital Type	Insurance Category	Product Type	Discharges	Total Claims Payments	Total Non-Claims Payments	Case Mix Index	Product-Specific Adjusted Base Rate = (C2+ C3) / (C1*C4)	Product-specific RP = C5/ C7 (HMO or PPO)	Network Average ABR
Hospital 1	Acute	Commercial	HMO	251	\$460,661	\$105,491	1.5	\$1,503.72	0.14	HMO: \$11,119.21
	Acute	Commercial	PPO	237	\$582,240	\$81,406	1.6	\$1,750.12	0.27	PPO: \$6,448.47
Hospital 2	Acute	Commercial	HMO	73	\$453,685	\$90,602	0.7	\$10,651.41	0.96	
	Acute	Commercial	PPO	295	\$56,882	\$111,764	1.8	\$317.60	0.05	
Hospital 3	Acute	Commercial	HMO	49	\$955,453	\$76,962	0.7	\$30,099.56	2.71	
	Acute	Commercial	PPO	228	\$61,774	\$125,589	0.7	\$1,173.95	0.18	
Hospital 4	Acute	Commercial	HMO	242	\$838,973	\$128,995	1.8	\$2,222.15	0.2	
	Acute	Commercial	PPO	78	\$965,899	\$89,544	0.6	\$22,552.20	3.5	

Computing Hospital Inpatient Relative Price (All Products Combined):

To compute RPs for all product types combined (a.k.a. product-adjusted RP), product-specific ABRs are weighted by the network average product mix values. Network average product mix values is calculated as the sum of payments corresponding to each product type divided by total network payments across all product types (see Table D). For example, for HMO:

$$Network\ Average\ Product\ Mix_{HMO} = \frac{Total\ Payments_{HMO}}{Total\ Network\ Payments} = \frac{\$3,110,822}{\$5,185,920} = 0.60$$

Table D. Computing Network Average Product Mix

Hospital	Hospital Type	Insurance Category	Product Type	Product Mix	Total Payments (claims + non-claims)	Network Average Product Mix
Hospital 1	Acute	Commercial	HMO	0.46	\$566,152	0.60
	Acute	Commercial	PPO	0.54	\$663,646	0.40
Hospital 2	Acute	Commercial	HMO	0.76	\$544,287	
	Acute	Commercial	PPO	0.24	\$168,646	
Hospital 3	Acute	Commercial	HMO	0.85	\$1,032,415	
	Acute	Commercial	PPO	0.15	\$187,363	
Hospital 4	Acute	Commercial	HMO	0.48	\$967,968	
	Acute	Commercial	PPO	0.52	\$1,055,443	
				Total Payments HMO	\$3,110,822	
				Total Payments PPO	\$2,075,098	
				Total Network Payments	\$5,185,920	

Step 1. Compute product-adjusted provider-specific price levels. The product-weighted ABRs are computed for each hospital by summing the multiplicative products of the product-specific ABRs and the network average product mix values (see Table E, column E3). For example, for Hospital 1:

$$ABR(Hospital\ 1) = ABR_{HMO}(Hospital\ 1) * 0.60 + ABR_{PPO}(Hospital\ 1) * 0.40 = \$1,602.32$$

Step 2. Calculate the product-adjusted network average price level, or product-adjusted base rate. This equals the mean of the product-weighted ABRs (see Table E, Column E4).

Step 3. Calculate product-adjusted RP for each provider. Product-weighted ABRs for each hospital are divided by the network average to obtain RP values for all product types combined (see Table E, Column E5).

$$RP(Hospital\ 1) = \frac{Product\ adjusted\ ABR\ (Hospital\ 1)}{Network\ average\ product\ adjusted\ ABR} = \frac{\$1,602.32}{\$9,250.26} = 0.17$$

In calculating Hospital Inpatient RP, several adjustments are applied to the data. First, within a given insurance category, product-specific RP is only computed when payments to a hospital associated with that product equal at least \$10,000. In addition, when the calculated ABR exceeds \$100,000, the ABR is truncated at \$100,000 to prevent outlier payments from skewing the results.

Table E. Computing Hospital Inpatient RP for All Product Types Combined

				E1	E2	E3	E4	E5
Hospital	Hospital Type	Insurance Category	Product Type	Product-Specific Adjusted Base Rate From Table C, Column C5	Network Average Product Mix (From Table D)	Product-Adjusted Base Rate (Step 1)	Network Average Product-Adjusted Base Rate (Step 2)	Product-Adjusted Inpatient Relative Price (Step 3)
						For each hospital, = Sum of (E1 series * E2 series)	= Mean of E3 series	= E3/E4
Hospital 1	Acute	Commercial	HMO	\$1,503.72	0.60	\$1,602.32	\$9,250.26	0.17
	Acute	Commercial	PPO	\$1,750.12	0.40			
Hospital 2	Acute	Commercial	HMO	\$10,651.41		\$6,516.43		0.70
	Acute	Commercial	PPO	\$317.60				
Hospital 3	Acute	Commercial	HMO	\$30,099.56		\$18,525.25		2.00
	Acute	Commercial	PPO	\$1,173.95				
Hospital 4	Acute	Commercial	HMO	\$2,222.15		\$10,357.03		1.12
	Acute	Commercial	PPO	\$22,552.20				

Hospital Outpatient

As for inpatient RP, payers submit data separately by hospital type and product type. Payers submit claims and non-claims payments and product mix, similar to inpatient data. The outpatient data does not contain volume information analogous to discharges. Instead, for each service type provided by hospitals, payers report multipliers and service mix values, which are explained below.

A service multiplier represents the negotiated mark-up (or mark-down) against the payer's standard fee schedule that a payer agrees to pay a given provider for a particular service category. For example, for laboratory services, a payer reports a multiplier of 1.15 for Hospital A and .90 for Hospital B. This indicates that the payer reimburses Hospital A 15% above the payer's standard fee schedule rate for that service line, whereas Hospital B receives 10% below the standard rate.

If the provider is not paid on a fee-for-service basis, the service multiplier may be calculated as the ratio of actual paid claims for a given service to the network average payment for that service (see Table F).

Table F. Service Multiplier Calculation – Ratio of Actual to Average Payments

Service category	F1	F2	F3
	Actual Payments made to provider for given insurance category and product type	Network average payment rate	Provider-specific service multiplier =F1/F2
Emergency Department	\$60,000	\$35,000	1.71
Lab	\$20,000	\$35,000	0.57
Radiology	\$20,000	\$25,000	0.80

Alternatively, service multipliers may be constructed based on unit costs for the underlying Current Procedural Terminology (CPT) codes (see Tables G1 and G2). When the service category includes only one CPT code, then the multiplier is derived as in the Service Category 1 (ER) example. When the service category includes more than one CPT code, then the multiplier is derived as in the Service Category 2 (Lab) example.

Table G1. Service Multiplier Calculation – Unit Cost Example 1

Service Category 1 (ER)			
	Provider A	Provider B	Network Average
Cost	100	1000	183.3333333
Units	1	5	=(100+1000)/(1+5)
Multiplier	0.545454545	1.090909091	
	=(Cost/Units)/Network Average Cost	=(Cost/Units)/Network Average Cost	
	=(100/1)/183.333333	=(1000/5)/183.333333	

Table G2. Service Multiplier Calculation – Unit Cost Example 2

Service Category 2 (Lab)			
CPT code x			
	Provider A	Provider B	Network Average
Cost	250	700	73.07692308
Units	3	10	=(250+700)/(3+10)
CPT code y			
	Provider A	Provider B	Network Average
Cost	300	700	83.33333333
Units	3	9	=(300+700)/(3+9)
Multiplier	1.172131148	0.945454545	
	=(Total cost)/(Sum of Units weighted by network average cost)	=(Total cost)/(Sum of Units weighted by network average cost)	
	=(250+300)/(3*73.08+3*83.33)	=(700+700)/(10*73.08+9*83.33)	

Service mix values are calculated as the shares of a provider's total claims payments corresponding to each of the payer-enumerated service categories.^{10,11} (See Table H.)

Table H. Sample Service Mix Calculation

	Service Category			
	Emergency Dept.	Lab	Radiology	Total
Total Claims Payments	\$60,000	\$20,000	\$20,000	\$11,000
Product Mix	0.60	0.20	0.20	--

Table I contains a sample of the outpatient data elements reported by payers.

Table I. Sample Hospital Outpatient Data

Hospital	Hospital Type	Insurance Category	Product Type	Service Category	I1	I2	I3	I4
					Service Multiplier	Service Mix	Total Hospital Claims Payments	Total Hospital Non-Claims Payments
Hospital 1	Acute	Commercial	HMO	Emergency Room	1	0.25	\$2,318,733.27	\$26,972.26
				Lab	1.14	0.15		
				Physician Services	1.13	0.6		
	Acute	Commercial	PPO	Emergency Room	1.09	0.19	\$1,018,406.12	\$11,826.00
				Lab	1.18	0.11		
				Physician Services	1.12	0.7		
Hospital 2	Acute	Commercial	HMO	Emergency Room	1.015	0.33	\$2,025,891.00	\$32,659.00
				Lab	1.04	0.23		
				Physician Services	1.03	0.44		
	Acute	Commercial	PPO	Emergency Room	1	0.32	\$1,925,618.00	\$10,649.00
				Lab	0	0		
				Physician Services	1.11	0.68		

Payers submit hospital outpatient payment data at the hospital-product level, for all services combined. In order to calculate RP, it is necessary to impute service-specific claims payments by multiplying total hospital claims payments by the respective service mix values (see table J, Column J2).

- 10 Calculations of service mix and product mix for Outpatient RP are based on claims payments only. Note the difference between the Inpatient calculation, which are based on the sum of claims and non-claims payments. This is because non-claims payments typically are not service-specific. Outpatient RP accounts for non-claims payments using a separate adjustment described later in this section.
- 11 The number and definitions of service categories are determined by each payer. Payers do not have to conform to a standard set of categories, as their relevant service lines and reimbursement arrangements vary. Payers are asked to submit service category data that best reflects their contracting arrangements.

Table J. Computing Service-Specific Claims Payments and Network Average Service Mix

Hospital	Hospital Type	Insurance Category	Product Type	Service Category	J1 Hospital-Specific Service Mix	J2 Service-specific Claims Payments J1* I3 (from Table I)	J3 Network Average Service Mix	J4 Sum of Network Average Service Mix, by provider (with zero correction)	
Hospital 1	Acute	Commercial	HMO	Emergency Room	0.250	\$579,683.32	0.287		
				Lab	0.150	\$347,809.99	0.187		
				Physician Services	0.600	\$1,391,239.96	0.525	1.00	
	Acute	Commercial	PPO	Emergency Room	0.190	\$193,497.16	0.275		
				Lab	0.110	\$112,024.67	0.038		
				Physician Services	0.700	\$712,884.28	0.687	1.00	
Hospital 2	Acute	Commercial	HMO	Emergency Room	0.330	\$668,544.03	0.287		
				Lab	0.230	\$465,954.93	0.187		
				Physician Services	0.440	\$891,392.04	0.525	1.00	
		Acute	Commercial	PPO	Emergency Room	0.320	\$616,197.76	0.275	
					Lab	0.000	\$0.00	0.000	
				Physician Services	0.680	\$1,309,420.24	0.687	0.96	
				Total Network Claims Payments	HMO	\$4,344,624.27			
					PPO	\$2,944,024.12			

Next, compute the network average service mix: for each product type, take the sum of claims payments for a given service category (see Table J, column J2) across all providers and divide by the total network claims amount for that product (see Table J, last 2 rows). This yields the product-specific network average service mix values (see Table J, column J3), which are the same across hospitals for a given product type. For example, the network average service mix for Emergency Room services within HMO products equals:

$$Network\ Average\ Service\ Mix_{HMO}(ER) = \frac{Total\ Claims\ Payments_{HMO}(ER)}{Total\ Network\ Claims\ Payments_{HMO}} = \frac{\$1,248,227.35}{\$4,334,624.27} = 0.287$$

Notice that Hospital 2 did not receive any payments for lab services for their commercial PPO product. As a result, the network average service mix is for this provider is set to 0, to avoid giving a positive weight to \$0 in payments. The sum of the network average service mixes for Hospital-PPO is .96 instead of the usual 1.0 (see Table K, Column K5). This value will be used to perform an adjustment in a later step.

Table K. Computing Hospital Outpatient Base Service-Weighted Multipliers

					K1	K2	K3	K4	K5	K6
Hospital	Hospital Type	Insurance Category	Product Type	Service Category	Service Multiplier	Hospital-Specific Service Mix	Service-specific Claims Payments (J2 from Table J)	Network Average Service Mix	Sum of Network Average Service Mix, by provider (with zero correction)	Base Service Weighted Multiplier = Sum of (K1*K3)/K5
Hospital 1	Acute	Commercial	HMO	Emergency Room	1.00	0.25	\$579,683.32	0.287		=1.093
				Lab	1.14	0.15	\$347,809.99	0.187		
				Physician Services	1.13	0.6	\$1,391,239.96	0.525	1	
	Acute	Commercial	PPO	Emergency Room	1.09	0.19	\$193,497.16	0.275		1.114
				Lab	1.18	0.11	\$112,024.67	0.038		
				Physician Services	1.12	0.7	\$712,884.28	0.687	1	
Hospital 2	Acute	Commercial	HMO	Emergency Room	1.015	0.33	\$668,544.03	0.287		1.027
				Lab	1.04	0.23	\$465,954.93	0.187		
				Physician Services	1.03	0.44	\$891,392.04	0.525	1	
	Acute	Commercial	PPO	Emergency Room	1	0.32	\$616,197.76	0.275		1.081
				Lab	0	0	\$0.00	0		
				Physician Services	1.11	0.68	\$1,309,420.24	0.687	0.96	

Computing Hospital Outpatient Relative Price (Product-Specific):

Step 1. Compute provider-specific, product-specific price levels.

For Hospital Outpatient data, provider-specific price levels are called base service-weighted multipliers. First, take the sum of the products of each service multiplier and the corresponding network average service mix value. Then divide the result by the sum of the network average service mixes for each hospital. Dividing by the sum of the network average service mixes takes into account any services not provided by a particular hospital, and is known as the zero correction.

For example, for Hospital 2, PPO, the base service weighted multiplier equals (see Table K, Column K6):

$$\text{Base Service Weighted Multiplier}_{PPO} (\text{Hospital 2}) = \frac{\sum_i \text{service multiplier}_{i,PPO} * \text{network avg service mix}_{i,PPO}}{\sum_i \text{network avg service mix}_{i,PPO}} = \frac{1.00 * 0.275 + 1.11 * 0.687}{.96} = 1.081$$

Table L. Computing Hospital Outpatient RP (Product-Specific)

				L1	L2	L3	L4	L5
Hospital	Hospital Type	Insurance Category	Product Type	Base Service Weighted Multiplier	Non-Claims Multiplier (for each product type)	Adjusted Rate	Network Average Adjusted Rate	Hospital Outpatient Relative Price
				Sum of (K1 series*K4 series)/K5	(G4/G3)*L1	(L1+L2)	Average of L3	L3/L4
Hospital 1	Acute	Commercial	HMO	1.093	0.013	1.106	1.091	1.014
	Acute	Commercial	PPO	1.114	0.013	1.127		1.033
Hospital 2	Acute	Commercial	HMO	1.027	0.017	1.043		0.956
	Acute	Commercial	PPO	1.081	0.006	1.087		0.996

The base service-weighted multiplier is computed using claims payment data only. To account for non-claims payments, the base multiplier is scaled up by a factor equal to total non-claims payments divided by total claims payments to obtain the Adjusted Rate (see Table L, Column L3). The Adjusted Rate is the outpatient equivalent of the inpatient Adjusted Base Rate.

Step 2. Compute product-specific network average Adjusted Rate. The network average Adjusted Rate equals the arithmetic mean of the provider-specific adjusted rates (Table L, column L4).

Step 3. Compute Hospital Outpatient RP. Outpatient RP for each hospital equals the Adjusted Rate divided by the network Average Adjusted Rate (see Table L, column L5). Within a given insurance category, product-specific outpatient RP is computed only when hospital payments associated with a given product equal \$5,000 or more.

Computing Hospital Outpatient Relative Price for All Products Combined (Product-Adjusted):

To calculate product-adjusted Outpatient RP, simply weight the Adjusted Rates by the network average product mixes. Similar to service mix, network average product mix equals to the amount of claims payments associated with a given product type divided by total network claims payments across all products (See Table M).

For example, the network average product mix for HMO products equals:

$$Network\ Average\ Product\ Mix_{HMO} = \frac{Total\ Claims\ Payments_{HMO}}{Total\ Network\ Claims\ Payments} = 0.596$$

Table M. Calculating Hospital Outpatient Network Average Product Mix

Hospital	Hospital Type	Insurance Category	Product Type	Product Mix	Total Hospital Claims Payments	Network Average Product Mix
Hospital 1	Acute	Commercial	HMO	0.695	\$2,318,733.27	0.596
	Acute	Commercial	PPO	0.305	\$1,018,406.12	0.404
Hospital 2	Acute	Commercial	HMO	0.513	\$2,025,891.00	
	Acute	Commercial	PPO	0.487	\$1,925,618.00	
				Total claims payments - HMO	\$4,344,624.27	
				Total claims payments - PPO	\$2,944,024.12	

Note that the network average product mix values for outpatient data are computed based on claims payments only. This aligns with the calculation of service mix values, which also are based on claims payments.¹²

Step 1. Calculate provider prices for all products combined. Take the weighted average of providers’ product-specific Adjusted Rates, weighting by the network average product mix values (see Table N, Column N3).

Step 2. Calculate the network average Adjusted Rate for all products combined. This equals the mean of the product-adjusted rates calculated in Step 1 (see Table N, column N4).

Step 3. Compute Hospital Outpatient RP for all products combined. Divide each provider’s product-adjusted Rate by the network average product-adjusted rate (see Table N, Column N5).

¹² See note 10.

Table N. Calculating Hospital Outpatient RP for All Products Combined

				N1	N2	N3	N4	N5
Hospital	Hospital Type	Insurance Category	Product Type	Adjusted Rate	Network Average Product Mix (from Table M)	Product-Adjusted Rate	Network Average Adjusted Rate	Hospital Outpatient Relative Price
				(L3 from table L)		For each hospital, = Sum of (N1 series * N2 series)	Average of N3	N3/N4
Hospital 1	Acute	Commercial	HMO	1.106	0.596	1.114	1.088	1.025
	Acute	Commercial	PPO	1.127	0.404			
Hospital 2	Acute	Commercial	HMO	1.043	0.596	1.061		0.975
	Acute	Commercial	PPO	1.087	0.404			

BLENDED RP

In addition to separate Inpatient and Outpatient RP values, CHIA calculates and reports blended RP, which combines these results. Blended RP is only reported for hospitals with payments exceeding both the inpatient and outpatient reporting thresholds, as previously specified.

Blended RP is calculated by weighting each hospital's inpatient and outpatient RP by the inpatient and outpatient shares of total network payments and adding these values.

Blended RP is calculated as follows:

1. Calculate Inpatient and Outpatient shares of total network payments. These are equal to total inpatient payments divided by total payments and total outpatient payments divided by total payments, respectively (see Table P.1, columns P6 and P7).

Table P.1 Computing Blended RP – Step 1

	P1	P2	P3	P4	P5	P6	P7
	Relative Price (RP)		Payments (as reported by payer)			Inpatient Share of Total Revenue =P3/P5	Outpatient Share of Total Revenue =P4/P5
	Inpatient RP	Outpatient RP	Inpatient	Outpatient	Total		
					=P3+P4		
Hospital 1	0.644	0.688	\$982,170	\$3,375,938	\$4,358,107	22.5%	77.5%
Hospital 2	1.803	1.574	\$1,978,945	\$6,280,404	\$8,259,349	24.0%	76.0%
Hospital 3	1.045	1.678	\$969,452	\$19,186,130	\$20,155,582	4.8%	95.2%
Hospital 4	0.669	1.615	\$1,258,477	\$6,994,578	\$8,253,055	15.2%	84.8%
Total			\$5,189,044	\$35,837,049	\$41,026,093	12.6%	87.4%

Table P.2 Calculating Blended RP – Step 2

	P1	P2	P3	P4	P5	P6	P7	P8
	Relative Price (RP)		Payments			Inpatient Share of Total Payments =P3/P5	Outpatient Share of Total Payments =P4/P5	Blended RP
	Inpatient RP	Outpatient RP	Inpatient	Outpatient	Total (P3+P4)			=P1*P6 + P2*P7
Hospital 1	0.644	0.688	\$982,170	\$3,375,938	\$4,358,107			0.68
Hospital 2	1.803	1.574	\$1,978,945	\$6,280,404	\$8,259,349			1.60
Hospital 3	1.045	1.678	\$969,452	\$19,186,130	\$20,155,582			1.60
Hospital 4	0.669	1.615	\$1,258,477	\$6,994,578	\$8,253,055			1.50
Total			\$5,189,044	\$35,837,049	\$41,026,093	12.65%	87.4%	

2. Compute Blended RP (see Table P.2, Column P8).

$$\begin{aligned}
 \text{Blended } RP_{\text{Hospital 1}} &= RP_{IP} * IP \text{ share of total payments} + \\
 & RP_{OP} * OP \text{ share of total payments} \\
 &= 0.644 * 0.1265 + 0.688 * 0.874 = 0.68
 \end{aligned}$$

RP COMPOSITE PERCENTILE RANK

As previously discussed, RP values are payer-specific, and cannot be used for comparing provider prices across payers. In order to make meaningful comparisons of provider price levels across payers, CHIA converts RP values into percentile terms. Within a payer's network, each provider's relative price is converted into a percentile, ranging from 0 to 100. Higher RP values translate to higher percentile ranks. For example, an RP percentile of 90 indicates that a provider has a higher RP value than 90% of all other, same-type providers in that payer's network. An RP percentile of 10 means that a provider's RP was lower than 90% of all other providers in that payer's network. The 50th percentile represents a payer's median RP. Because the percentile method uses the same ordered rank scale for all payers, the relative position of the provider may be compared across payers.

After RP values have been converted to percentile within each payer's network, CHIA also calculates a measure called Composite RP Percentile. For each provider, this equals the mean of the provider's RP values across all payers. In this case, a composite RP percentile of 90 indicates that the provider's RP was, on average, higher than 90% of other providers across all payer networks. The 50th percentile represents the network-wide median RP. The composite RP percentile gives a sense of the relative order of a provider's average RP across all payers compared to its peers within a given insurance market.

PHYSICIAN GROUP

CHIA requires payers to submit data for their top 30 physician groups, according to share of total physician group payments within each insurance category. Payers report the remaining below-threshold physician groups in the aggregate. Data elements reported by payers and the RP calculation methodology are analogous those used for hospital outpatient services. RP is calculated only for physician groups with product-specific payments exceeding \$1,000.

OTHER PROVIDER

Payers submit data separately for the following other provider types:

- Ambulatory surgery centers
- Community health centers
- Community mental health centers
- Freestanding clinical laboratories
- Freestanding diagnostic imaging centers
- Home health agencies
- Skilled nursing facilities

Payers must report data for providers that received at least three percent of a payer's total network payments for a given provider type. Providers not meeting this threshold are combined and reported in aggregate. The data elements and RP calculation method for Other Provider types are analogous to the Hospital Outpatient and Physician Group data and methods. RP is calculated only for providers receiving at least \$1,000 in product-specific payments.

CONCLUSION

CHIA's Relative Price data provides crucial information for monitoring the performance of health care providers in the Massachusetts health insurance market, and bolsters the Commonwealth's goals of promoting price transparency.

CHIA will update this document to reflect any changes to RP data collection and methodology.

For more information, please contact: Catlin Sullivan, Policy Implementation Manager, at catlin.sullivan2@state.ma.us



center
for health
information
and analysis

For more information, please contact:

CENTER FOR HEALTH INFORMATION AND ANALYSIS

501 Boylston Street
Boston, MA 02116
617.701.8100

www.chiamass.gov

Publication Number 16-259-CHIA